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ABSTRACT

The effects on student teaching behavior of a relatively traditional, lecture-based, general secondary methods course are compared to the effects of a laboratory-oriented, competency-based course. The classroom performance of two groups of student teachers (30 of whom completed the competency-based course and 40 of whom completed the lecture-based course) was assessed by two trained observers, the student teachers themselves, the high school students in the classroom, and the cooperating teacher and supervisor. Recordings were analysed with the Flanders categories. Findings show a significant difference in favor of the competency-based group on both trained observation measures but no significant difference on most other measures. (In addition to the description of the study, this paper includes a literature review of performance-based teacher education.) (Author/JA)

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# THE EFFECTS OF COMPETENCY-BASED TEACHER EDUCATION ON STUDENT TEACHING

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"THE EFFECTS OF COMPETENCY-BASED TEACHER EDUCATION UPON STUDENT TEACHING"

## THE PROBLEM

A review of current literature on education reveals that education, and in particular teacher education, needs improvement. Conant examined teacher education in the United States and concluded:

> One finds a complete lack of agreement on what constitutes a satisfactory general education program for future teachers . . . the amount of time to be devoted to such studies (education in a specific field) in college and the level of competence to be demanded opinions differ.[1]

Dr. Conant continued by stating that there is almost as much confusion associated with courses in education as exists in general education:

> There is little agreement among professors of education on the nature of the corpus of knowledge they are expected to transmit to the future teachers.[2]

It also appears that such practices in teacher education as lectures on how to teach, reading methods books and other related materials, and discussions about teaching procedures have only limited value in preparing teachers for the task ahead. Students in the nation's classrooms need teachers who can skillfully perform those teaching tasks which optimize learning.

The search for significant teacher education experiences which produce more competent teachers, and thus, optimize classroom learning has been long and arduous. The following programs and materials illustrate the involvement of governmental and professional agencies in the search: USOE teacher education models; the American Association of Colleges for Teacher Education performance-based teacher education publications; and the Association of Teacher Educators' 1973 Conference theme, "Performance-Based Teacher Education." The concept of performance or competency-based teacher education emerged in the latter part of the Sixties as one promising alternative way to

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[1] James Bryant Conant, The Education of American Teachers (New York: McGraw-Hill Book Company, Inc., 1963), p. 209.

[2] Ibid., p. 210.

prepare teachers. Improvement of teaching competencies appears to offer the best promise for increased learning in the classroom. However, if national implementation is to be encouraged, scientific investigation and testing of the effectiveness of this approach are imperative.

Theoretical lecture-oriented teaching methods courses which constitute most of the pre-service training of prospective teachers do not seem to adequately prepare teachers for classroom teaching. In these courses undergraduate education students listened to lectures, read books and handouts, and/or talked about teaching methods in small and large groups.

The College of Education at the University of Missouri-Columbia has not only been searching for better teacher education experiences, but has also been developing such a program by revising both the content and instructional activities of a required undergraduate secondary general methods course. What used to be a lecture-based course has become a competency-based one.

## Background for the Study

Teacher education at the University of Missouri-Columbia for the most part followed a pattern similar to that followed by comparable institutions in other parts of the nation. After a survey of the students enrolled in the D110 course, Secondary School Curriculum and Instruction, revealed widespread dissatisfaction with a traditional approach to the training of teachers, a committee of faculty and graduate and undergraduate students undertook to develop a new course. The original course was characterized as a lecture-based (LB) course (control treatment), since most instruction was accomplished through lectures.

## Curriculum Revision

Although this research is primarily a validation study, or what may be described as a causal-comparative or quasi-experimental study, the treatment, however, deals with the five basic areas which constitute curriculum design. Objectives were reexamined in the light of current literature on teacher education; a large number of PBTE models were reviewed; a significantly new theoretical approach was taken in analyzing the learning process as it relates to teacher education; the selection of curriculum experiences was based upon a specific set of desired learning

outcomes or competencies which are thought to result from the performance of specific instructional tasks; special attention was given to organization of curriculum; and finally, the competency-based approach to improving scope and sequence of activities with emphasis upon the essential elements of this approach may be considered the most innovative of all the dimensions of this new design.

A significant result of the efforts to revise the curriculum was the preparation and publication of a useful, clearly stated handbook or text which emphasizes student performance, observation, peer interaction (feedback), and an analytic examination of a specific competency at an identifiable level of competence. This course was characterized as a competency-based (CB) course (experimental treatment).

## Essential Elements of the CBTE Course

The newly revised D110 course was implemented in August, 1971. Each semester approximately 350 education students are enrolled in the new course. In view of the large number of students enrolled, classes and facilities were scheduled in such a manner so as to provide each student an opportunity to meet for one hour each week in a large group (seventy) where the module was introduced by the developer. A demonstration of the given skill and instructions for preparing for and participating in the two-hour laboratory session were provided.

The laboratory sessions were planned so as to provide a performance-based educational experience in small groups of twenty students, these groups were further subdivided into smaller groups of five to ten students. Laboratory sessions were conducted by UMC instructors and teaching assistants. Graduate and undergraduate students served as leaders for the small lab groups. Grading was established on a pass/fail basis, but each student had the option of working for a letter grade if he desired to do so. This letter grade was based upon demonstration of proficiency in the teaching tasks which constituted the course. All instructional activities and evaluation procedures had but one purpose--the development of specific teaching competencies.

Since the beginning of the new course, considerable feedback was received on each teaching task. Student responses to questions about the course, objectives, etc., followed the same general pattern shown in the following sample question: "In general was the D110 a valuable experience"? Forty-two and six tenths per cent strongly agreed, 43.4 per cent slightly agreed, 5.7 per cent were

undecided, 5.9 per cent slightly disagreed, 2.4 per cent strongly disagreed (N=258). More than 1,000 teacher education students have completed the new course, and comments received from the students during evaluation sessions have been consistently similar to those cited above.

## Purpose of the Study

This research was undertaken to determine if a general undergraduate secondary methods course is a more effective solution to the problem of influencing student teaching if it is competency-based than if it is lecture-based. The specific question remains, is this new competency based course more effective than the old lecture-based one?

Specifically, the study compared the effects upon classroom teaching of two teacher preparation courses--the lecture-based treatment and the competency-based treatment. Effects of the modifications on student teaching performance were assessed through the use of selected instruments and/or devices.

## Independent Variable

The independent variable in this study was a course of study listed in the general catalogue of the University of Missouri-Columbia as "D110, Secondary School Curriculum and Instruction." It is a required course for all secondary teacher education students. Further, the independent variable has been subdivided into two treatments.

Lecture-based treatment.--A series (two hours per week for sixteen weeks) of educational experiences characterized by classroom lectures, demonstrations, reading, talking with other students and instructors, and asking questions about course content, books, handouts, reference materials, etc. At least two objective-type, pencil and paper tests were included as part of the education experience. This treatment is identified as the Lecture-Based (LB) course.

Competency-based treatment.--This course is a series of educational experiences (one-hour demonstration and a two-hour laboratory each week for sixteen weeks), characterized by a "systems" approach to teacher training. Each student is assigned fourteen instructional tasks and provided an opportunity to develop and practice specific teaching competencies in a "safe" laboratory environment while engaged in a variety of simulated teaching activities.

This treatment is identified as the Competency-Based (CB) course.

The revised course seeks to develop specific teaching competencies to optimize learning, rather than perpetuating traditional instructional procedures. Each education student is provided an opportunity to learn about, practice, and develop a high degree of professional competence. Some essential elements of the revised course which play a vital part in helping the student develop these competencies are early performance of specific teaching tasks, observation of self and others teaching, describing teaching analytically, and interacting with peers with a view toward seeking alternative behaviors. Five key aspects of the laboratory experience may be listed as follows:

1. A laboratory setting--performing the task competently.
2. Separate focus week by week upon a wide range of student oriented objectives (students' needs).
3. A wide variety of alternative teaching performances were introduced.
4. A spirit of mutual trust and development prevailed.
5. Definiteness of goals.

## Dependent Variable

The dependent variable is a set of teaching behaviors exhibited by each subject while engaged in student teaching. Measurement of the dependent variable was accomplished by the employment of six different instruments or devices which contain a variety of criterion measures (empirical and hypothetical constructs) purported to determine the existence of a given phenomenon and the extent to which it is present during the student teaching performance. All these dependent variables were scaled on a five-point, bipolar, Likert-type scale.

## Research Questions

This investigator posed the following research questions:

1. For all subjects, is there a significant difference between the LB and the CB courses in their effect upon the student teacher's classroom performance as reflected by the:
   a) Observer Schedule (Appendix C):
      1) Total scores?
      2) Four subscores?
      3) Eighteen item variable scores?
   b) Teaching Techniques Rating Form (Appendix D):
      1) Total scores?
      2) Twenty-four-itme variable scores?
   c) Teacher's Self-Report (Appendix E):
      1) Total scores?
      2) Forty-five-item variable scores?
   d) Student Opinionnaire (Appendix F):
      1) Total scores?
      2) Twenty-six-item variable scores?
   e) Cooperating Teacher's and Supervisor's Report (Appendix G):
      1) Total scores?
      2) Thirty-two-item variable scores?
   f) Flanders Interaction Analysis System (Appendix H):
      1) Derived scores?
      2) I/D ratios?

2. For each of the following two subgroups--male and female--is there a significant difference between the LB and the CB courses in their effect upon the student teacher's classroom performance as reflected by the:
   a) Four Observer Schedule (C) Subscores?
   b) Teaching Techniques Rating Form (D)?
   c) Teacher's Self-Report (E)?
   d) Student Opinionnaire (F)?
   e) Cooperating Teacher's and Supervisor's Report (G)?

3. For each of the four subject areas--language arts, social studies, science, and mathematics--is there a significant difference between the LB and the CB courses in their effect upon the student teacher's classroom performance as reflected by the:
   a) Four Observer's Schedule (C) Subscores?
   b) Teaching Techniques Rating Form (D)?
   c) Teacher's Self-Report (E)?
   d) Student Opinionnaire (F)?
   e) Cooperating Teacher's and Supervisor's Report (G)?

4. For each of the six grade levels--grades seven through twelve--is there a significant difference between the LB and the CB courses in their effect upon the student teacher's classroom performance as reflected by the:
   a) Four Observer Schedule (C) Subscores?
   b) Teaching Techniques Rating Form (D)?
   c) Teacher's Self-Report (E)?

d) Student Opinionnaire (F)?
e) Cooperating Teacher's and Supervisor's Report (G)?

5. For the total pupulation, is there a significant difference between the LB and the CB courses in their effect upon the student teacher's classroom performance as reflected by student teaching letter grade scores?

## Statement of Hypotheses

The following general hypothesis in null form summarizes the research questions presented in this report:

There is no significant difference between the scores achieved by the LB group and the CB group as reflected on the following instruments:

a) Observer Schedule
b) Teaching Techniques Rating Form
c) Teacher's Self-Report
d) Student Opinionnaire
e) Cooperating Teacher's and Supervisor's Report
f) Flander's Interaction Analysis System Subscores:
   1) Derived total scores
   2) I/D ratio scores

All subjects as well as the following subgroups were tested: male and female; four subject areas (language arts, social studies, science, and mathematics); grade levels seven through twelve; and student teaching letter grades. All data based upon the above measures were presented in the following format: Total scores; subscores; and item variable scores.

## Assumptions, Postulates, and Limitations

The following assumptions, postulates, and limitations relative to this investigation are listed here.

Assumptions.

1. A relationship between conventional methods of preparing teachers and alleged widespread unsatisfactory performance in the classroom exists.
2. That the quality of the preparation of teachers is related to effectiveness of teaching in the classroom.
3. That effectiveness of teaching in the classroom is related to the learning in many classrooms.

4. That the empirical and hypothetical constructs employed in this study are adequate to assess teaching behaviors in the classroom.

5. That empirical results obtained from the treatments are related to the hypotheses presented herein.

Postulates.

1. That quantitative differences in values associated with the dependent variable are the results of the differential treatments incorporated into the research design.

2. Extraneous variables associated with this study which were difficult or impossible to control may exert equal effects at random on all treatments or conditions.

Limitations.

1. Some extraneous variables which cannot be identified will operate systematically toward confounding the study; however, these variables will tend to effect each group or subject to the same extent and, in effect, are "randomized out" and controlled during statistical analysis. These variables which cannot be controlled by other techniques may be identified by such factors as previous learning and/or concomitant learning experiences (special method courses, experimental curriculum experiences in other courses, etc.), motivational level, and super and supra influences.

2. This is a quasi-experimental design, since the treatment for the control group preceded that of the experimental group by one semester, and in a few cases, by two semesters. However, many of the control subjects completed student teaching at the same time as the experimental group.

3. The extent to which raters were free of bias is a limitation in this study.

4. The results of this study are generalizable to other populations only to the extent that they reflect characteristics similar to that used in this study.

## Significance of the Study

The approach to teacher education taken in the competency-based course which is the subject of this investigation is not new or novel. A theoretical bases for implementation of the laboratory approach to teacher training has existed since the early days of the progressive education movement.

Development of professional laboratory experiences which are an integral part of the preparation program may not be the answer to the problem of making teacher education

programs more effective than they are now. However, many researchers claim that the gap between theory and practice in the training of teachers is still about as wide as it was twenty-five years ago. Professional laboratory experiences may help close this gap, and give teacher education programs a professional quality they now lack.

While there is no hard evidence that the competency-based course reduces educational costs, the utilization of graduate and undergraduate students as small group leaders at little or no cost represents a heretofore untapped instructional resource. It would appear then that improved teacher education is possible at approximately the same nominal cost of the lecture-based course.

The significance of the findings from this study could provide teacher educators with substantial evidence that a competency or performance-based experience is or is not superior to a conventional lecture-oriented or lecture-based preservice teacher training experience.

## Definition of Terms

Key terms which are employed in this study are operationally defined as follows:

Competency-based teacher education (CBTE). A competency-based teacher education program is one in which the competencies to be acquired by the student and the criteria to be applied in assessing the competency of the student are made explicit and the student is held accountable for meeting those criteria. Two types of criteria will be used here: (1) knowledge criteria which are used to assess cognitive understandings, and (2) performance criteria which are used to assess the teaching behaviors.[1]

Criterion-referenced measures. Measures which "depend on an absolute standard of quality . . . as opposed

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[1]Howard L. Jones, "Implementation of Programs" Chapter 6), Competency-Based Teacher Education, W. R. Houston and R. B. Howsam (eds.) (Chicago: Science Research Associates, Inc., 1972), p. 122.

to norm-referenced measures, which depend on a relative standard."[1]

Mediated materials. Instructional materials which require the use of audio-visual material such as film-strips, videotape recorders, etc.[2]

Microteaching. A teaching situation which is scaled down in terms of time, content, and number of students. It usually is a four- to twenty-minute lesson involving three to ten students. (The microteaching units which are involved in this investigation are three- to five-minute sessions involving four or five students.)[3]

Module or teacher task. A set of learning activities intended to facilitate the student's acquisition and demonstration of a particular competency or objective.[4]

Performance-based teacher education (PBTE). The definition which will be employed in this investigation is taken from one of the earliest current research projects on the subject of performance-based teacher education.

> The condition of teaching requires each teacher to make decisions and translate the decisions into

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[1]Robert Glaser, "Instructional Technology and the Measurement of Learning Outcomes," American Psychologist, 18 (1963), 519; and R. Glaser and A. J. Nitko, "Measurement in Learning and Instruction," Educational Measurement, R. L. Thorndike (ed.) (Washington, D.C.: American Council on Education, 1971). These authors redefined Glaser's 1963 definition as follows: "A criterion-referenced test is one that is deliberately constructed to yeild measurements that are directly interpretable in terms of specified performance standards (p. 516)."

[2]Jones, 1972, op. cit., p. 102.

[3]Teaching Skills: A Handbook for Developing Instructional Behavior (Columbia, Missouri: The University of Missouri-Columbia, June, 1972), p. 2-2.

[4]Benjamin S. Bloom, "Mastery Learning and Its Implications for Curriculum Development," Confronting Curriculum Reform, Elliot W. Eisner (ed.) (Boston: Little, Brown and Co., 1971).

actions (performance). Accountability for performance (both teacher and learner) will be based on the quality of decisions as well as actions.[1]

Professional laboratory experiences. All those contacts with children, youth, and adults (through observation, participation, and teaching--including simulation exercises) which make a direct contribution to an understanding of individuals and their guidance in the teaching/learning process.[2]

Student teaching. "The period of guided teaching when student takes increasing responsibility for the work with a group of learners over a period of consecutive weeks."[3]

Systems approach. A self-correcting and logical methodology of decision-making to be used for the design and development of man-made entities. Concept of task analysis is included.

Task analysis. A process by which the designer of a system identified and describes all its necessary parts--goals, tasks, materials, procedures, prerequisites, knowledge, performance(s), etc. Concept includes formulation of performance objectives, the analysis of functions and components, the distribution of function among components, their scheduling, the training and testing of the system, installation, and quality control.

Teacher behavior. This term is operationally defined as representing the effects of a teacher in a given classroom situation. It is further defined in a behavioral sense, in that it is a group of variables or stimuli--a set of teaching behaviors which affect the learners.[4]

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[1]Texas Performance-Based TTT Project, A Proposal for Educational Personnel Development Operational Grant, Part D, EPDA Act of 1965 (Austin: State Education Agency), p. F1.

[2]Sub-Committee of the Standards and Surveys Committee, American Association of Colleges for Teacher Education, School and Community Laboratory Experiences in Education (Oneonta, New York: American Association of Colleges for Teacher Education, 1948), p.7.

[3]Sub-Committee of the Standards and Surveys Committee, AACTE, 1948, op. cit., p. 16.

[4]Bloom, 1971, op. cit.

## REVIEW OF THE LITERATURE

Since this research study deals, generally, with the education of prospective teachers and specifically, with the substantive issue of improving teacher education, this review of the literature and related research is limited to the three areas which appear to have received the most attention and which are most relevant to this study--teacher behavior, instrumentation, and performance-based teacher education. Researchers generally agree that these areas constitute the most perplexing, most misunderstood, and most challenging aspects of improving teacher education.

### Performance-Based Teacher Education (PBTE)

According to current literature on teacher education, there is increased concern about the quality of teacher education programs throughout the country. The American Association of Colleges for Teacher Education and the National Council for Accreditation in Teacher Education have recommended that colleges and universities which offer teacher training programs undertake to expand and improve programs according to recently revised criteria.[1] For example, one criterion for judging a teacher education program is whether it produces competent graduates who enter the profession and perform effectively.[2] This would imply that considerably more attention must be given to the formative assessment phase of the preparation program. The AACTE established a special committee in 1970 to look into performance-based teacher education. This committee has reported that performance-based teacher education is viewed by at least one observer as a multi-faceted concept in search of practitioners and there are, however, antecedents, developments, and growing pressures which suggest that a reform movement of great potential is in the making.

Since PBTE provided a theoretical basis for the course of study under investigation, information relative to the development of this approach to teacher education is especially relevant. PBTE is one of the more promising aspects of teacher ecucation that has been developed in recent years--it may be described as either performance-based or competency-based teacher education. The concept

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[1] AACTE, Recommended Standards for Teacher Education: The Accreditation of Basic and Advanced Preparation Programs for Professional School Personnel (Washington, D.C.: American Association of Colleges for Teacher Education, 1970).

[2] Ibid. (Standard 5, NCATE).

has been defined by educators in a variety of ways; however, Cooper and Weber defined this approach to teacher education as follows:

> A competency-based teacher education program is one in which the competencies to be acquired by the student and the criteria to be applied in assessing the competency of the student are made explicit and the student is held accountable for meeting those criteria.[1]

Elfenbein indicated the "PBTE programs are incipient phenomena exhibiting characteristics often associated with youth, experiementation, enthusiasm, commitment, zeal, and uncertainty of results."[2] The programs that she studied occupied a range in terms of affiliation and size, the rationale, the development and implementation procedures, the supports for the programs, and the positions on a theoretical-practical continuum.

Elam[3] emphasized that PBTE in the United States is by no means a full-fledged movement. He indicated that AACTE has studied the phenomenon for more than a year and has not only established a committee under the leadership of Dr. Donald R. Medley to study the subject, but also developed a number of papers devoted to its various aspects. The AACTE and the National Council for Accreditation of Teacher Education are providing new leadership in meeting the challenge of change and improvement in teacher education. They have advocated (1) moving from single-type preparation programs to multiple preparation programs; (2) more attention to the nature of the professional role for which the students are being prepared; and (3) increasing concern for the performance of graduates,

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[1]James M. Cooper and Wilford A. Weber, A preliminary draft of "A Competency-Based Systems Approach to Teacher Effectiveness," Chapter I, Vol. II, Performance-Based Teacher Education Programs: A Comparative Description, Iris M. Elfenbein (Washington, D.C.: American Association of Colleges for Teacher Education, 1972), pp. 3-4.

[2]Iris M. Elfenbein, Performance-Based Teacher Education Programs: A Comparative Description (Washington, D.C.: American Association of Colleges for Teacher Education, 1972), p. 7.

[3]Stanley Elam, Performance-Based Education: What is the State of the Art? (Washington, D.C.: American Association of Colleges for Teacher Education, December, 1971), p. 8.

not the kind and number of courses "required." A recent revision of the recommended standards now includes "specific professional training components, in addition to the content for teaching specialty, humanistic and behavioral studies, teaching and learning theory, and a practicum."[1] This along with the fact that some progress is being made in developing a viable "theory of teaching" are indications of how seriously the AACTE and the NCATE view the problem of improving teacher education.

The American Association of Colleges for Teacher Education selected for examination seventeen model teacher education programs from thirteen institutions throughout the country which were in operation prior to August 1, 1971. Each institution was visited and the program examined by team members representing the AACTE committee and the U.S. Office of Education to determine if the programs met published criteria for PBTE or CBTE programs. Findings of the investigation along with specific criteria have been published by the association.[2]

While the advocates of CBTE programs appear to be more numerous than the antagonists, there are those who would offer arguments against the CBTE approach itself, or against some of the essential elements or characteristics of it. Simons appeared to take a critical view of several aspects of CBTE. He felt that the CBTE emphasis on behavior as a criterion in assessment is accomplished at the expense of knowledge. He stated his position as follows:

> There is no way to link either understanding or interpretation with particular behavior. . . . The behavioral objectives movement seems misguided in its zeal to deal mainly in behavior to the exclusion of knowledge and the relationship between knowledge and behavior. In fact, the entire movement seems doomed to failure because it lacks the necessary theories. . . . Behavioral evidence of knowledge can be described and measured through the traditional means, namely, standardized tests, subjective judgments, rating scales, teacher-made tests, etc. These techniques have many problems, but behavioral objectives provide no real improvement over these traditional techniques.[3]

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[1]Elfenbein, 1972, op. cit., p. iii.

[2]Elam, 1971, op. cit., p. 24.

[3]Herbert D. Simons, "Behavioral Objectives: A False Hope for Education," The Elementary School Journal, 73:4 (January, 1973), p. 176.

Broudy, in presenting a critique of the competency-based approach to teacher education, stated that although he had some reservations about the competency-based approach, in particular, the "technician" rather than the professional emphasis upon teaching, his position on CBTE was not too much different from that of the American Association of Colleges for Teacher Education, namely, "That CBTE is a response to social pressures and to criticism of existing programs."[1]

Other researchers, while not especially critical of the CBTE or PBTE approach, suggested alternatives. Gage[2] suggested developing more adequate "tools of the trade," and Rosenshine[3] suggested a "curriculum-materials" approach, in which curriculum models referred to a set of instructional materials and instructions for their use. The Biological Sciences Curriculum Study (BSCS) Program and the Bank Street College Program may be cited as examples of this approach to research and teaching. The "curriculum-materials" model is similar to the CBTE model, in that the "package" is comparable to the "module," and contains well-formulated strategies for implementation. According to Rosenshine,[4] models or packages appear to be particularly useful settings for study because the programs incorporated (1) ideas developed from research, (2) inventions and intuitions of experienced teachers and subject area specialists, and (3) feedback data developed in the early try-out phases of the programs.

As may be expected because of the recency of the CBTE movement in teacher education, there is only a limited amount of research available relative to the effects of the competency-based approach in the education of teachers. Waimon, Bell, and Ramseyer[5] reported a study which attempted to assess the effects of competency-based training

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[1]Harry S. Broudy, A Critique of Performance-Based Teacher Education (Washington, D.C.: The American Association of Colleges for Teacher Education [AACTE], May, 1972), p. 12.

[2]Gage, 1963, op. cit., p. 257.

[3]Rosenshine and Furst, 1971, op. cit.

[4]Rosenshine, 1971a, op. cit.

[5]M. D. Waimon, D. D. Bell, and G. C. Ramseyer, "The Effects of Competency-Based Training on the Performance of Prospective Teachers: (A paper presented at the Annual Meeting of the American Educational Research Association, New York, February, 1971).

on the performance of prospective teachers. The experiment involved three treatments designed to help prospective teachers perform pretutorial behaviors based upon the theoretical work of Ausubel, Bruner, and Gagne.[1] These researchers contended that the amount and rate of learning are influenced by the nature of the subject matter, the way it is broken down, and the order in which it is presented.

The treatment in this experiment was similar to that found in most microteaching instruction. It consisted of dividing the tutorial teaching behavior into component parts, each of which was defined and modeled. Practice in performing each behavior was given and reinforcement was made contingent upon the successful performance of each. The treatment was labeled microplanning. The microplanning enabled prospective teachers to perform pretutorial behavior, which not only precedes tutorial behavior in time but also relates and explains it.

The researchers concluded that:

> Teachers cannot be clear and rigorous in handling subject matter inputs during the course of instruction unless they have learned to perform pretutorial teacher behaviors; that is, prospective teachers have learned how to solve problems having to do with purpose, content, or method before they engage in tutorial behavior.[2]

Further, an assumption that the preplanning phase appears vital to success during both the microteaching phase and the clinical phase appears justified. It is also concluded that:

> . . . it may be that prospective teachers should never be allowed to engage in tutorial behavior before they demonstrate their competence in performiing pretutorial teacher behavior. Microteaching, unless preceded by successful performance in micro-planning, could be a case of misplaced emphasis.[3]

Other researchers who only recently attempted to assess a variety of competency-based programs may also be

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[1] Ibid., p. 237.

[2] Ibid., p. 244.

[3] Ibid.

cited. Harste[1] found a marked decrease in student learning as measured by the Iowa Test of Basic Skills at the third-grade level and a nonsignificant finding on the influence of the experimental program on student learning at the sixth-grade level. Sybouts[2] reported an attempt to assess the effectiveness of a competency-based program at the University of Nebraska by measuring the achievement of students who were taught a single concept by both traditionally prepared teachers and those prepared in a competency-based program. Students taught by the competency-based teachers appeared to achieve significantly higher mean scores than those taught by the traditional teachers. Emmer[3] conducted a study to determine if instructional behaviors acquired during a simulated teaching experience would transfer to a "real" setting. He found there was some evidence that instructional behavior from a peer setting would transfer or improve when applied in a real school setting.

J. W. Maucker, Assistant to the President of Kansas State University, provided the following advice on competency-based teacher education (quoted in part):

> Enter into the dialogue--don't ignore it. Study the "State of the Art" papers (Elam, 1971) and other professional position papers and attend the conferences in your area.
>
> Try PBTE at least in part of your teacher education program.
>
> Do not undertake the above unless you can meet at least the following three criteria:
>
> a. Develop a cooperative relationship with the college or university and with one or more school districts and obtain substantial student input.

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[1]J. C. Harste, "The Effect of a Field-Based Teacher Education Program Upon Pupil Learning" (A paper presented at the Annual Meeting of the American Educational Research Association, New Orleans, Louisiana, February, 1973).

[2]Ward Sybouts, "Performance-Based Teacher Education: Does It Make a Difference?" Phi Delta Kappan, XIV (January, 1973), pp. 303-304.

[3]E. T. Emmer, "Transfer of Instructional Behavior and Performance Acquired in Simulated Teaching," The Journal of Educational Research, LXV (December, 1971), pp. 178-182.

b. Provide substantial time for staff planning and development before the program is put into operation.

c. Incorporate a strong evaluation and assessment program . . . investing at least as much time of the staff in definition of acceptable "evidence" and the development of evaluation instruments and techniques as in the development of instructional materials.

Support research and development efforts by professional organizations and associations and by the federal and state governments.[1]

Summary

A review of the literature and research which relates to the areas of education selected--teacher behavior, instrumentation, and performance or competency-based teacher education--appear to show several definite trends.

Studies which deal with teaching behavior seem to reflect a rather continuous change in direction. Focus is no longer on characteristics or traits possessed by the teacher, but on the behavior of the teacher in the classroom. Increased emphasis has been placed upon how the teacher behaves in a variety of settings. Objective measures have been developed to measure the interaction between teacher and student. Considerably more attention is being given to the effects that teacher produced stimuli have upon the learner. Researchers who deal with assessment of teaching appear to be moving toward an increased realization that, in the final analysis, the only criterion which is important as it relates to the assessment process is the cirterion which includes the effect of teaching behavior upon the students.

Instrumentation appears to have moved in the same general direction as teaching behavior. There are indications that the "check scale" or rating form has given way to more objective measures of teaching behavior and to performance reports which yield data describing a specific set of teaching behaviors and the effects they have upon

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[1] J. W. Maucker, "Performance-Based Teacher Education," American Association for Teacher Education Yearbook, Vol. I (Washington, D.C.: American Association of Colleges for Teacher Education, 1972), pp. 74-77.

the student. However, there is some evidence that rating forms possess some worthwhile characteristics when compared to other methods or systems which are being employed in assessing teaching behavior. Rosenshine reported that he had completed some work on this subject and included the following in his findings:

> . . . some observational systems (the rating system) which distort reality appear to be more predictive of student achievement than the systems which more closely represent actual events.[1]

In the latter instance the researcher was referring to the variety of observation analysis systems similar to the Flanders Interaction Analysis System. For example, in studies reviewed by Rosenshine and Furst, evidence such as the following was suggested: "the most consistent results and the highest correlations and F ratios were obtained from the variables in rating systems."[2] Assessment in teaching appears to be moving toward competencies or performance type criterion measures designed to assess the quality of the end product. Many of these criterion measures will, as a result of public pressure for accountability indices, move toward a fixed standard which is directly related to both criterion-referenced and formative assessment.

There appears to be ample and impressive testimony that student teaching tends to be the most practical and useful part of pre-service education. In addition, questionable effects of traditional teacher education seem to pervade both the literature and recent doctoral studies.[3] These factors appear to be a basis for a movement in teacher education toward performance or competency-based education. A "systems" or "instructional designs" approach to teacher education is held to improve the effectiveness of the teacher educational program.[4] This approach to teacher education is receiving national attention, and when all the results are tabulated, the question

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[1] B. Rosenshine, "The Use of Direct Observation to Study Teaching," Second Handbook of Research on Teaching, R.M.W. Travers (ed.), p. 136.

[2] Rosenshine and Furst, 1971, op. cit.

[3] R. F. Peck and J. A. Tucker, "Research on Teacher Education," Second Handbook of Research on Teaching (Chicago: Rand McNally and Co., 1973), p. 967.

[4] Ibid., p. 943.

of which is more effective--traditional, lecture-based methods of preparing teachers, or the more dynamic, performance or competency-based methods--may be answered.

One must conclude from a review of the literature that one of the main issues in teacher education appears to be the accountability of teachers for meeting behavioral objectives, as well as colleges of education meeting higher standards for the professional certification of teachers. The graduate of a competency-based program will, in the future, emerge with a given set of behaviors relative to teaching. If these objectives have been chosen as representing minimal standards for effective teaching, then each graduate leaves the program with a demonstrated ability to know and to do those things that are believed necessary for effective teaching.

## RESEARCH METHOD

A between group design with one independent variable and two treatment levels is employed in this study. The independent variable is identified as a general secondary methods course of study, and the two treatments as (1) the Lecture-Based (LB) Course (the control group) and (2) the Competency-Based (CB) Course (the experimental group). These variables are operationally defined in the "Definition of Terms" on pages 4 and 9.

As indicated above the independent variable consists of those two assigned values or treatments. The experimenter attempted to determine whether these two treatments or conditions differentially affected the dependent variable or variables. The dependent variable is identified as the classroom behavior of student teachers. It is represented by sets of scores on selected criterion measures. Dependent variable set scores (total scores, subscore sets, and 145 item variable scores) are compared by total group, subgroups, and treatment groups.

The population for this study is defined as all secondary student teachers (eighty-five) assigned to public and private schools in the mid-Missouri area. The population student taught during the last half of the Fall, 1971, and two halves of the Winter, 1972, semesters in the following subject areas--language arts, social studies, science, and mathematics. The mid-Missouri geographical area is defined as an area thirty to forty miles from the University of Missouri-Columbia. Several kinds of administrative organizations are represented by the schools selected. For example, there are junior high schools, grades seven, eight, and nine and grades seven and eight only; high schools, grades nine through twelve and ten, eleven, and twelve; and junior-senior high schools, grades seven through twelve. Distribution of subjects between public and private schools is approximately equal.

In August, 1971, the lecture-based method of teaching the D110 course was discontinued and the competency-based method introduced. Those education students who completed the course prior to that date were assigned to the control group (LB course) and those who completed it after that date to the experimental group (CB course). Treatment groups were equated by cumulative grade point average to within .0003 honor points and by subject area according to total number within each subpopulation. No attempt was made to equate groups by sex or by grade levels taught. The stratified sample consisted of forty

student teachers in the control group (LB) and thirty in the experimental group (CB) (N=70).

## Data Collection

The observation of each student teacher took place during the end of their eight weeks of student teaching. All observations were made in conjunction with the university supervisor's regular visit to each school, when possible.

Permission was obtained from each school official prior to each visit and he was advised of the purpose, the data collection procedure, and expected dates of the visits. Identification of subjects according to group (experimental or control) was withheld. Each school official was furnished a list of student teachers, cooperating teachers, and university supervisors.

## Instrumentation

A wide variety of instruments and/or devices were employed in this study to provide the investigator with a more accurate assessment of teaching behaviors which occurred during the student teaching performance. Some of these instruments had been used by the university for several years already, while others were developed for use in the competency-based course as part of the instructional assessment phase. Each instrument or assessment device was carefully designed or selected to yield measures which would contain a minimum of error. The precision in assessing the experimental effect upon the dependent variable is based upon such factors as the accuracy of defining the variable measured, the skill of the observer in detecting the presence of the given variable, and variety of variables identified. Since the dependent variable--teaching performance--is extremely complex and contains many factors, it was observed from six different points of view. Assessments of teaching behaviors were made by the following: two reports by trained observers, a self-report by each student teacher, a cooperative assessment by the cooperating teacher and the college supervisor, an assessment by the classroom students, and a more objective assessment based upon the analysis of audio-tapes according to the categories in Flanders Analysis System.

Each instrument or device employed in this study to gather information about the teaching performance of each

subject was desinged to yield data which were quantified on the basis of frequency of occurrence and/or intensity of response, and accurate within the parameters which were prescribed.[1] Competent observers were trained to assess performance according to a five-point, bipolar, Likert-type scale from high (5) to low (1).

Some comments relative to the development and/or adoption of the instruments employed in this investigation are presented here.

D110 Observation Schedule (C)

The D110 Observation Schedule was developed by university instructors who were involved in assessing the quality of the laboratory teaching of those D110 students who wanted to receive a letter grade rather than a pass/fail grade in the CB course. The objectives or competencies of the course served as the basis for these items.

Teaching Techniques Rating Form (D)

The device in its present form was assembled by the investigator from a prototype such as the one developed by Rose.[2] The form was modified to meet the needs and purposes of this study in the sense that only those items were used which would lend themselves to use by an impartial observer who was present in the classroom and who possessed no additional information about the student teacher or the lesson she was teaching. Items were carefully selected from a wide range of teaching performance assessment instruments to obtain a clearly defined set of items which would reflect those facets of teaching generally included in an assessment of instruction.

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[1]Assessment of teacher behavior in this investigation was based upon criteria listed under operational definition for "performance-based teacher education." This information is shown in the "Definition of Terms" section. Criteria of two types are used--knowledge to assess understanding and performance criteria to assess the teaching behaviors. A majority of criterion measures are contingent upon some behavioral manifestation or demonstration of a particular teaching skill. The latter may also be referred to as a "performance test."

[2]Homer C. Rose, The Instructor and His Job (Chicago: American Technical Society, 1961), pp. 266-277.

Teacher's Self-Report (E)

Development and adoption of the Teacher's Self-Report were based upon several factors. First, a self-rating form which was prepared by Callahan[1] and published by Scott Foresman, Inc., was used as the main guide for the development of the instrument. Second, several forms used by the University of Missouri for the improvement of instruction served as a pool of items. Third, the experience of the researcher in assessing teaching behavior over the past ten years provided a basis for selection of appropriate items. Only those items thought to correlate highly with the independent variable under study were selected for the instrument.

Student Opinionnaire (F)

Development of the Student Opinionnaire was based upon several factors. First, a form used at the University of Missouri provided a pool of items and also served as a guide in developing measurement criteria. A large number of criterion measures derived from the literature on pupil assessment of teaching were identified and items were written or revised to represent these criteria in the instrument; then the items were reworded to meet the reading level of junior high school students. These items were then "tried out" or revised in undergraduate teacher education classes until an acceptable level of instructor agreement was reached. The researcher and other members of the development team drew upon their own experience in reaching a consensus in terms of selecting and eliminating items which were considered on the original instrument.

Cooperating Teacher's and Supervisor's Report (G)

The Cooperating Teacher's and Supervisor's Report (Student Teaching Record) was developed by Dr. Carey Southall, Director of Student Teaching, College of Education, University of Missouri-Columbia. The form was created for the specific purpose of rating student teacher performance. It was designed to be completed by the cooperating teacher and the university supervisor on a cooperative basis. General criteria for identifying strengths and weaknesses are provided. More detailed criteria are contained in the

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[1]Sterling G. Callahan, Self-Evaluation Checklist for Teachers in Secondary Education (Glenview, Illinois: Scott Foresman, Inc., 1966).

structure of the form, since criterion measures are organized under the following six major headings or subdivisions: attitude, scholarship, instruction, discipline, personality, and miscellaneous. No information relative to procedures followed by the university in determining validity or reliability was available.

Flanders Interaction Analysis System (H)

While the trained observer was recording observations on his two instruments, an audio-tape recording was made of each teaching lesson or performance. Some researchers, who have been concerned with the subject of assessment of teaching performance, indicated that it is one of the better means to describing classroom behavior developed over the past ten years. With the use of analytic categories of classroom behavior, this yields more objective data. It lends itself to a more reliable approach to the collection, recording, and analysis of the data. Following is a brief summary of the instrument categories to be used and the procedures to be applied in processing the data.

In the Flanders system, those categories labeled as "indirect" influences are seemingly related to the open end of the climate continuum; those labeled "direct" influences may be related to the closed end of the continuum. The author claimed that his system will measure both verbal and nonverbal interaction between the teacher and the students in the classroom and that evidence of verbal interaction is indicative of nonverbal interaction which may also be present.[1]

Training was undertaken to improve coding reliability beyond that required for classroom performance feedback to teachers. Information relative to the use of the Flander's system published by Flanders, Amidon and Flanders

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[1]Ned A. Flanders, Teacher Influences, Pupil Attitudes, and Achievement. Cooperative Research Monograph No. 12 (Washington, D.C.: U.S. Department of Health, Education, and Welfare, Office of Education, OE 25040, 1965), p. 6.

and Greenberg[1] was used in the training sessions and in analyzing the data. Doctoral studies by Dahl and Romoser[2] were also employed as reference documents during this study. After extensive coding practice a minimum of .85 reliability level of coding was obtained. Procedures were as follows:

1. Two segments of instruction from the tape recorded classroom performance of a student teacher were selected for analysis, one at the one-third point and another at the two-thirds point of the recorded session. Each segment was about five minutes in length.

2. The researcher coded these sections of the audio-tapes according to the ten Flanders Interaction Analysis categories.

3. A coding sheet was prepared which provided tally space beside each of the ten Flander's categories.

4. While listening to the recorded segment, the coder placed a tally every three seconds (or every category change, whichever occurred first) in the space which described the type of verbal behavior exhibited during the preceding three seconds. Wherever necessary, the segment was rerun and the coding repeated until maximum precision was attained.

5. After coding a segment of recorded instruction, the coder summed the tallies in each of the ten categories and determined the percentage of the total tallies in each category. Tht total percentages of tallies was then determined according to three major categories: indirect

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[1]Ned A. Flanders, Analyzing Teaching Behavior (Reading, Mass.: Addison-Wesley Publishing Co., 1970); Edmond J. Amidon and Ned A. Flanders, The Role of the Teacher in the Classroom (rev. ed.; Minneapolis, Minn.: Association for Productive Teaching, Inc., 1967), p. 37; and Selma Greenberg, Selected Studies of Classroom Teaching: A Comparative Analysis (Scranton, Pennsylvania: International Textbook Company, 1970).

[2]Ivan J. Dahl, "Analysis and Evaluation of Certain Attitudinal and Behavioral Changes in Selected Student Teachers During the Professional Laboratory Experience with an Experimental Variable of Supervisory Personnel" (unpublished Doctor's dissertation, University of North Dakota, 1968); and David R. Romoser, "Change in Attitude and Perception in Teacher Education Students Associated with Instruction in Interaction Analysis: (unpublished Doctor's dissertation, University of Denver, 1964).

teacher talk (categories 1, 2, 3, and 4), direct teacher talk (categories 5, 6, and 7), and student talk (categories 8 and 9). Both the indirect and the direct teacher talk categories were also combined and their percentage determined.

6. Mean percentage scores were computed and recorded for both segments for each subject.

7. These percentage scores were then converted into "bipolar" scores (1 to 5) using Table I below.

In the following scale the lowest score (1) represents interaction as teacher talk (90 to 100 per cent) with only up to 10 per cent as student talk, or as student talk (100 to 90 per cent) with only up to 10 per cent teacher talk. This category represents little interaction between teacher and students. The highest score (5) represents interaction situations where up to half was student talk (50 to 41 per cent) with teacher talk being 50 to 59 per cent, or where up to half was teacher talk (41 to 50 per cent) with student talk being 59 to 50 per cent. This category represents much teacher-student interaction.

TABLE I

PERCENTAGE SCORE CONVERSION TABLE

| Teacher (T) Student (S) | T | S | T | S | T | S | T | S | T | S |
|---|---|---|---|---|---|---|---|---|---|---|
| Percentage Scores Between | 90 & 100 | 10 & 0 | 80 & 89 | 20 & 11 | 70 & 79 | 30 & 21 | 60 & 69 | 40 & 31 | 50 & 59 | 50 & 41 |
| | 0 & 10 | 100 & 90 | 11 & 20 | 89 & 80 | 21 & 30 | 79 & 70 | 31 & 40 | 69 & 60 | 41 & 50 | 59 & 50 |
| Bipolar Scores | 1 | | 2 | | 3 | | 4 | | 5 | |

In addition to a bipolar score of one to five representing the amount of student talk, the relative amount of indirect and direct teacher talk was determined.

To do this, the total number of tallies in categories 1, 2, 3, and 4 was divided by the total number of tallies in all the teacher talk categories (1 through 7). This quotient is referred to as the I/D ratio or the ratio of indirect to direct teacher talk. For example, an I/D ratio of .50 means that for every three seconds of indirect teacher talk there were at least three seconds of direct teacher talk. (It should be pointed out that this comparison is relative and does not relate to the coding procedure, per se, since the rule for coding is "every three seconds or category change, whichever occurred first.") An I/D ratio of .67 means that there was twice as much indirect teacher talk as direct teacher talk; and consequently, an I/D ratio of .33 means that there was only half as much indirect teacher talk as direct.

## Data Treatment

The data collection procedures were described in detail in a previous section of this report. Analyses of the data were made according to total scores, subset scores, and item variable scores, which were yielded by the six ranking-type instruments and the quantified letter grades. Since all data, except the I/D ratio scores (variable H2), were quantified on a five-point, Likert-type scale, analysis of scores included descriptive statistics (mean scores, standard deviations, and variance).

These basic statistical data were used to describe selected attributes of teaching behavior by group. However, significance data which include critical values ($z$ and $U$), and probability ($p$) values shown on the same form were based upon "distribution free" tests of significance.

Since data derived in the study were considered ordinal data which approaches interval data, nonparametric tests of significance were employed. The "distribution free" characteristic allows the researcher to make a more independent assessment of significance. Further, the quality of the findings are increased because fewer limitations and restrictive assumptions are placed upon the statistics employed in analyzing the data. Siegel[1] also indicated that certain assumptions are associated with most statistical tests and those associated with the nonparametric test include the assumption that the observations are independent and that the variable under study has

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[1]Sidney Siegel, Nonparametric Statistics for the Behavioral Sciences (New York: McGraw-Hill Book Co., 1956), p. 3.

underlying continuity, but these assumptions are fewer and much weaker than those associated with parametric tests. Moreover, he stated that nonparametric tests do not require measurement so strong as that required for the parametric tests and that most nonparametric tests apply to data in an ordinal scale and some apply to data in a nominal scale.

## Rationale for Use of Nonparametric Tests

The assumptions associated with the one-way analysis of variance or "F" test are that the observations are independently drawn from normally distributed populations, all of which have some variance. A requirement of the "F" test or "t" test is that the data must achieve at least interval measurement of the variable involved. It should also be noted here that interval measurement depends for the most part upon exact scaling of psychometric properties of the stimuli.

In this study total scores based upon ordinal scaling were used, but in addition, the individual items on each instrument also provide a basis for analysis and comparison to resolve the "normality" or scaling problem. Since the assumption of "normality" is related directly to the scaling, advantages of employing nonparametric tests which do not require the assumption of normality appear to offset some of the advantages associated with parametric testing. Another advantage of utilizing "distribution free" tests of significance is that one may conclude that "Regardless of the shape of the population, we may conclude that . . . ."[1]

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[1]Henry E. Garrett, Statistics in Psychology and Education (New York: Longmans, Green and Co., 1953), p. 321.

# DATA AND FINDINGS

In this chapter the data are organized in terms of each of the hypotheses. Each table of data is followed by a brief description of these data and the related findings. The findings are then summarized in Figure 1.

## Hypothesis One--D110 Observation Schedule

For all subjects, there is no significant difference between the control (LB) group and the experimental (CB) group as measured by the various scores obtained from the "D110 Observation Schedule"

a) Total score (C).
b) Subscores (C1, C2, C3, C4).
c) Item variable scores (C1a-g, C2a-c, C3a-e, C4a-c).

These data are shown in Table II.

Data.--Variables identified as C1 through C4 are subscores from the D110 Observation Schedule. Each subsection of this instrument contains from three to seven items. Statistical data for each of the eighteen separate items on this instrument (as well as the four subscores and the total score) are presented and discussed below:

An examination of Table II shows that the CB group scored higher than the LB group on all twenty-three "D110 Observation Schedule" variables. Of these twenty-three variables, twenty-one were significantly higher using the Wilcoxon Rank Sum Test. Only two item variables--"student/teacher interaction" and "openness, tolerance, consideration"--were not significantly higher. All four subscores (C1, C2, C3, and C4) and the total score (C) were significant at the .01 level--$z$ values of 3.03, 3.87, 4.15, 3.90, and 4.04, respectively.

Findings.--The total score hypothesis, the four subscore hypotheses, and sixteen of the eighteen item variable score hypotheses were rejected. Of the twenty-three subhypotheses for the "D110 Observation Schedule," twenty-one were rejected. The control (LB) group was found to differ significantly from the experimental (CB) group on twenty-one of these twenty-three variables. By inspecting the means this difference was found to favor the experimental (CB) group.

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**TABLE II**

D110 OBSERVATION SCHEDULE SCORES BY CONTROL (LB) GROUP AND EXPERIMENTAL (CB) GROUP

| Var. Nr. | Variable Name | LB Group Mean | LB Group SD | CB Group Mean | CB Group SD | Significance* z Value | Significance* p Value |
|---|---|---|---|---|---|---|---|
| C1 | RELATIONAL/CLIMATE | 3.11 | 0.59 | 3.61 | 0.62 | 3.03 | .003** |
| a | Acceptance of students | 3.15 | 0.83 | 3.63 | 0.77 | 2.45 | .014** |
| b | Clarity of instructional goals | 3.30 | 0.61 | 3.77 | 0.94 | 2.46 | .014** |
| c | Conveying goal expectations | 3.43 | 0.78 | 4.00 | 0.83 | 3.06 | .002** |
| d | Student/teacher interaction | 3.43 | 0.96 | 3.77 | 0.63 | 1.34 | .180 |
| e | Student/student interaction | 2.40 | 1.11 | 2.90 | 0.92 | 2.10 | .035* |
| f | Motivating students | 2.93 | 0.97 | 3.60 | 0.86 | 2.77 | .006** |
| g | Openness, tolerance, consideration | 3.15 | 0.86 | 3.60 | 0.86 | 1.75 | .079 |
| C2 | CONTENT INTRODUCTION | 2.94 | 0.58 | 3.56 | 0.60 | 3.87 | .0001** |
| a | Real or simulated stimuli | 2.73 | 0.96 | 3.27 | 0.91 | 2.37 | .018* |
| b | Nonverbal expression | 2.80 | 0.82 | 3.60 | 0.77 | 3.80 | .0001** |
| c | Symbolic stimuli | 3.30 | 0.61 | 3.90 | 0.61 | 3.05 | .002** |
| C3 | COGNITIVE DEVELOPMENT | 2.50 | 0.78 | 3.45 | 0.90 | 4.15 | .0000** |
| a | Many examples | 3.03 | 0.95 | 3.77 | 0.86 | 3.29 | .001** |
| b | Exploring examples | 2.98 | 0.97 | 3.80 | 0.96 | 3.27 | .001** |
| c | Comparing/ranking examples | 2.43 | 1.17 | 3.23 | 1.31 | 2.60 | .009** |
| d | Creating examples | 1.85 | 1.00 | 2.30 | 1.32 | 4.34 | .0000** |
| e | Summarizing concept | 2.23 | 0.86 | 3.17 | 0.95 | 3.91 | .0001** |
| C4 | RELATING TO PRIOR KNOWLEDGE | 2.69 | 0.88 | 3.52 | 0.80 | 3.90 | .0001** |
| a | Number and variety | 2.78 | 0.92 | 3.47 | 0.86 | 3.29 | .001** |
| b | Clarity of concept | 2.65 | 1.08 | 3.67 | 0.92 | 3.97 | .0001** |
| c | Explicitness and specificity | 2.65 | 0.92 | 3.43 | 0.90 | 3.44 | .0006** |
| | D110 OBSERVATION SCHEDULE | 2.81 | 0.63 | 3.54 | 0.64 | 4.04 | .0001** |

(CB) N=30 (LB) N = 40

The underlined mean indicates which group achieved the higher mean score.

*Significant at .05 (z of 1.96) level on two tailed, nondirectional test.

**Significant at .01 (z of 2.58) level on two tailed, nondirectional test.

*Wilcoxon Rank Sum Test and Mann-Whitney U statistic used to determine significance.

**TABLE III**

TEACHING TECHNIQUES RATING FORM SCORES BY CONTROL (LB) GROUP AND EXPERIMENTAL (CB) GROUP

| Var. Nr. | Variable Name | LB Group Mean | LB Group SD | CB Group Mean | CB Group SD | Significance* z Value | Significance* p Value |
|---|---|---|---|---|---|---|---|
| 1 | Awareness of many ways to present information | 2.85 | 0.80 | 3.30 | 0.75 | 2.33 | .020* |
| 2 | Sensitive to student and environment | 3.18 | 0.96 | 3.70 | 0.70 | 2.38 | .017* |
| 3 | Maintaining order through effective teaching | 3.50 | 0.93 | 4.23 | 0.82 | 3.28 | .001** |
| 4 | Handles clrm in quiet efficient manner | 3.43 | 0.78 | 3.93 | 0.83 | 3.05 | .002** |
| 5 | Competence in subject | 3.83 | 0.71 | 4.30 | 0.54 | 2.88 | .004** |
| 6 | Sets reasonable objectives for lesson | 3.40 | 0.55 | 3.93 | 0.58 | 3.50 | .0005** |
| 7 | Translates learning objectives into varied learning activities | 2.83 | 0.90 | 3.60 | 0.89 | 3.25 | .001** |
| 8 | Selection of content consistent with pupils' interests, needs, and abilities | 2.98 | 0.86 | 3.47 | 0.73 | 2.37 | .018* |
| 9 | Uses original and imaginative ideas | 3.03 | 1.00 | 3.40 | 1.30 | 1.53 | .127 |
| 10 | Motivates children | 3.10 | 0.98 | 3.43 | 0.82 | 1.51 | .131 |
| 11 | Enthusiastic about content | 2.73 | 0.93 | 2.86 | 0.78 | 0.91 | .363 |
| 12 | Uses student experience and knowledge | 3.13 | 0.94 | 3.93 | 1.05 | 3.19 | .001** |

(CB) N=30 (LB) N=40

The underlined mean indicates which group achieved the higher mean score.

*Significant at .05 level on two-tailed, nondirectional test.

**Significant at .01 level on two-tailed, nondirectional test.

*Wilcoxon Rank Sum Test and Mann-Whitney U statistic used to determine significance.

**TABLE III (continued)**

| Var. Nr. | Variable Name | LB Group Mean | LB Group SD | CB Group Mean | CB Group SD | Significance* z Value | Significance* p Value |
|---|---|---|---|---|---|---|---|
| 13 | Learning situations lead to increased responsibility and participation | 3.30 | 0.97 | 3.57 | 1.04 | 2.46 | .014* |
| 14 | Conveys positive expectations to students | 3.23 | 0.89 | 3.67 | 0.76 | 2.22 | .026* |
| 15 | Asks stimulating questions | 3.25 | 0.90 | 4.07 | 0.79 | 3.76 | .0002** |
| 16 | Guiding student contributions and questions | 3.23 | 0.86 | 3.63 | 0.85 | 1.79 | 0.73 |
| 17 | Adapting to learning situation and using feedback effectively | 3.20 | 0.88 | 3.67 | 0.84 | 2.26 | .024* |
| 18 | Choice of words and conveying ideas clearly and effectively | 3.25 | 0.71 | 3.73 | 0.58 | 3.04 | .002** |
| 19 | Sensitive to feelings and attitudes; anticipates and meets needs and differences | 2.85 | 0.80 | 3.37 | 0.77 | 2.54 | .011* |
| 20 | Diagnose pupil problems | 3.05 | 0.93 | 3.10 | 0.85 | 0.31 | .758 |
| 21 | Selects and uses supplemental aids | 2.65 | 0.86 | 2.93 | 0.98 | 1.20 | .229 |
| 22 | Handling controversial issues | 2.95 | 0.85 | 3.63 | 0.62 | 3.49 | .0005** |
| 23 | Skill with relational problems | 3.03 | 0.77 | 3.63 | 0.62 | 3.38 | .0007** |
| 24 | Developing subject in a meaningful and relevant manner | 3.53 | 0.75 | 3.87 | 0.82 | 1.7, | .073 |
| D | TEACHING TECHNIQUES RATING FORM | 3.14 | 0.58 | 3.64 | 0.52 | 3.51 | .0005** |

Hypothesis One--Teaching Techniques Rating Form

For all subjects, there is no significant difference between the control (LB) group and the experimental (CB) group as measured by the various scores obtained from the "Teaching Techniques Rating Form":

a) Total score (D).
b) Item variable scores (1-24).

These data are shown in Table III.

Data.--An examination of Table III shows that the CB group scored higher than the LB group on all twenty-five "Teaching Techniques Rating Form: variables. Of the twenty-four item variables, eighteen were significantly higher using the Wilcoxon Rank Sum Test. Only seven item variables--"uses origninal and imaginative ideas," "motivates children," "enthusiastic about lesson content," "guiding student contributions and questions," "diagnosing pupil problems and differentiating between individual and common problems," "selects and uses illustrative and supplementary aids," and "subject developed in a meaningful and relevant manner," were not significant in favor of the CB group. Total score (D) was significant at the .01 level--z value of 3.51. Z values and p values (probability) are given in Table III.

Findings.--The total score hypothesis and seventeen of the twenty-four item variable score hypotheses were rejected. Of the twenty-five subhypotheses for the "Teaching Techniques Rating Form," eighteen were rejected. The control (LB) group was found to differ significantly from the experimental (CB) group on eighteen of these twenty-five variables. By examining the means this difference was found to favor the experimental (CB) group.

Hypothesis One--Teacher's Self-Report

For all subjects, there is no significant difference between the control (LB) group and the experimental (CB) group as measured by the various scores obtained from the "Teacher's Self-Report":

a) Total score (E).
b) Item variable scores (1-45).

These data are shown in Table IV.

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TABLE IV

TEACHER'S SELF-REPORT BY CONTROL (LB) GROUP AND EXPERIMENTAL (CB) GROUP

| Var. Nr. | Variable Name | LB Group Mean | LB Group SD | CB Group Mean | CB Group SD | Significance t Value | Significance p Value |
|---|---|---|---|---|---|---|---|
| 1 | Secure attention of the class before starting | 3.50 | 0.72 | 3.20 | 0.89 | 1.50 | .13 |
| 2 | Pupils ready for work w/o needless delay | 3.23 | 0.92 | 3.00 | 0.79 | 1.04 | .30 |
| 3 | Await specific signal for dismissal | 3.30 | 1.29 | 2.60 | 1.13 | 2.34* | .02 |
| 4 | Excessive talking by t. creates discipline problems | 3.45 | 0.85 | 3.37 | 0.96 | 0.25 | .08 |
| 5 | Establish specific procedures for carrying out routine tasks 95% of the time | 3.43 | 0.96 | 3.23 | 0.97 | 0.61 | .54 |
| 6 | Keeping group fully employed | 3.53 | 0.87 | 3.33 | 1.24 | 1.63 | .10 |
| 7 | Extent to which child is profitably employed during day | 3.28 | 1.15 | 3.53 | 0.73 | 0.90 | .37 |
| 8 | Keeping background of children in mind | 3.55 | 0.96 | 3.33 | 0.96 | 0.62 | .53 |
| 9 | Distinguishing between individual help and reteaching subject | 3.43 | 1.01 | 3.33 | 0.88 | 0.31 | .76 |
| 10 | My voice as a teaching aid | 3.70 | 0.82 | 3.27 | 0.83 | 2.36* | .02 |

(CB) N=30 (LB) N=40

The underlined mean indicates which group achieved the higher mean score.
*Significant at the .05 level on a two-tailed test.
**Significant at the .01 level on a two-tailed test.

TABLE IV (continued)

| Var. Nr. | Variable Name | LB Group Mean | LB Group SD | CB Group Mean | CB Group SD | Significance t Value | Significance p Value |
|---|---|---|---|---|---|---|---|
| 11 | Pleasantly relax and still business-like | 3.78 | 0.92 | 3.63 | 1.03 | 0.48 | .63 |
| 12 | My interest and enthusiasm arouse and maintain that of the student | 3.30 | 0.91 | 3.23 | 0.86 | 0.50 | .62 |
| 13 | Avoid errors in spelling, grammar, and pronunciation | 3.60 | 1.19 | 3.40 | 0.86 | 1.27 | .20 |
| 14 | Shun habit of purposeless griping about things that are nobodys fault or that cannot be easily remedied | 4.13 | 0.97 | 3.63 | 1.07 | 1.98* | .05 |
| 15 | A good housekeeper | 3.75 | 0.84 | 3.33 | 1.03 | 2.04* | .04 |
| 16 | Cultivates own imagination and initiative | 3.48 | 0.99 | 3.30 | 0.95 | 0.69 | .49 |
| 17 | Efficient use of chalk boards and teaching devices | 3.58 | 1.11 | 3.23 | 1.25 | 1.11 | .27 |
| 18 | Achieving neat and attractive clrm | 3.23 | 0.97 | 3.20 | 0.71 | 0.12 | .91 |
| 19 | Taking care of school equipment and supplies as one's own | 4.10 | 1.01 | 3.95 | 1.14 | 0.59 | .56 |
| 20 | Control of clrm light | 4.03 | 1.00 | 3.50 | 1.04 | 2.23* | .03 |
| 21 | Proper heat & ventilation in classroom | 3.85 | 0.98 | 3.47 | 0.97 | 1.55 | .12 |
| 22 | Desk adjustments | 3.13 | 1.57 | 2.67 | 1.47 | 1.59 | .11 |
| 23 | Maintaining classroom records, plan, etc. | 3.73 | 1.11 | 3.63 | 1.00 | 0.53 | .60 |
| | TECHNIQUES & ATTITUDES | | | | | | |
| 24 | Plan work in advance | 3.65 | 1.05 | 3.57 | 1.07 | 0.28 | .78 |
| 25 | Avoiding excessive use of textbook | 3.80 | 1.14 | 3.43 | 1.22 | 1.33 | .18 |
| 26 | Checking papers, workbooks, and work of others who do it | 3.73 | 1.11 | 3.57 | 0.97 | 0.87 | .38 |

TABLE IV (continued)

| Var. Nr. | Variable Name | LB Group Mean | LB Group SD | CB Group Mean | CB Group SD | Significance t Value | Significance p Value |
|---|---|---|---|---|---|---|---|
| 27 | Clrm grouping efficient | 3.33 | 1.19 | 2.80 | 1.27 | 1.45 | .15 |
| 28 | Grpg system reduces stigma or other disadvantages | 3.15 | 1.19 | 2.90 | 1.42 | 0.60 | .55 |
| 29 | Assist entire class rather than those who ask questions | 3.53 | 1.24 | 3.70 | 0.92 | 0.33 | .74 |
| 30 | Precision and direct in directions | 3.58 | 0.96 | 3.43 | 0.94 | 0.67 | .50 |
| 31 | Use of audio visuals | 3.23 | 1.09 | 3.20 | 1.03 | 0.29 | .77 |
| 32 | Atmosphere of quiet busyness in classroom | 3.10 | 0.98 | 2.73 | 0.87 | 1.63 | .10 |
| 33 | Understanding problems of parents | 3.40 | 1.24 | 3.43 | 1.14 | 0.05 | .96 |
| 34 | Cultivating goodwill and understanding of parents | 3.15 | 1.21 | 2.87 | 1.25 | 0.87 | .38 |
| 35 | Wasting of class time | 3.33 | 0.94 | 3.33 | 0.96 | 0.06 | .96 |
| 36 | Accepting after school duties | 3.73 | 0.91 | 3.73 | 0.98 | 0.11 | .91 |
| 37 | Liking children and their knowing of my affection of them | 3.75 | 1.17 | 3.83 | 1.21 | 0.39 | .70 |
| 38 | Praise of student work honest and sincere | 3.88 | 0.99 | 3.70 | 1.21 | 0.39 | .69 |
| 39 | Assigning marks according to realistic standards and abilities of students | 3.63 | 1.06 | 3.60 | 0.93 | 0.35 | .73 |
| 40 | Class conscious of language and spelling in written and spoken work | 3.68 | 0.92 | 3.27 | 0.79 | 1.98* | .05 |

TABLE IV (continued)

| Var. Nr. | Variable Name | LB Group Mean | LB Group SD | CB Group Mean | CB Group SD | Significance t Value | Significance p Value |
|---|---|---|---|---|---|---|---|
| 41 | Using experience of the child to stimulate interest in subject | 3.48 | 1.11 | 3.13 | 0.97 | 1.32 | .188 |
| 42 | Is subject meaningful | 3.23 | 0.95 | 3.17 | 0.91 | 0.28 | .783 |
| 43 | Each child receives maximum opportunity for learning in the subjects | 3.53 | 0.85 | 3.67 | 0.84 | 0.78 | .436 |
| 44 | Sharing responsibility for unsatisfactory work of class | 3.63 | 0.98 | 3.57 | 0.90 | 0.09 | .929 |
| 45 | Looking for new ideas & materials for improving teaching | 3.43 | 1.11 | 3.53 | 0.73 | 0.35 | .725 |

Data.--An examination of Table IV shows that the LB group scored higher than the CB group on thirty-six of the forty-five item variables. Of these thirty-six variables, six were significantly higher using the Wilcoxon Rank Sum Test. There were no item variable scores for the CB group which were significantly higher than those of the LB group. All six item variable scores were significant at the .05 level--z and p values are shown in Table IV for these variables. Total score (3) was not significant at the established level (.05 on a nondirectional test). Z and p values are 1.39 and .163, respectively. While each variable on the previous two instruments (both reflecting the perceptions of a trained observer) favored the experimental (CB) group, this self-report generally favors the control (LB) group.

Findings.--The total score hypothesis and thirty-nine of the forty-five item variable score hypotheses were accepted. Of the forty-six subhypotheses for the "Teacher's Self-Report," forty were accepted. The control (LB) group was found to differ significantly from the experimental (CB) group on only six of these forty-six variables. Significance on these six variables was in the direction of the LB group.

Hypothesis One--Student Opinionnaire

For all subjects, there is no significant difference between the control (LB) group and the experimental (CB) group as measured by the various scores obtained from the "Student Opinionnaire":

a) Total score (F).
b) Item variable scores 1-26).

These data are shown in Table V.

Data.--An examination of Table V shows that the LB group scored higher than the CB group on all twenty-six "Student Opinionnaire" variables. Of these twenty-six variables, only three were significantly higher using the Wilcoxon Rank Sum Test and established alpha level. However, three additional item variable scores were significant at the .05 level on a directional test. Z and p values for total score and item variables are shown in Table V.

Findings.--The total score hypothesis and twenty-three of the twenty-six item variable hypotheses were accepted. Of the twenty-seven subhypotheses for the

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**TABLE V**

STUDENT OPINIONNAIRE BY CONTROL (LB) GROUP AND EXPERIMENTAL (CB) GROUP ON ITEM VARIABLES

| Var. Nr. | Variable Name | LB Group Mean | LB Group SD | CB Group Mean | CB Group SD | Significance t Value | Significance p Value |
|---|---|---|---|---|---|---|---|
| 1 | Ability to stimulate others | 3.64 | 0.56 | 3.45 | 0.48 | 1.54 | .124 |
| 2 | Control and direction of class | 3.69 | 0.49 | 3.64 | 0.42 | 0.53 | .597 |
| 3 | Attitude toward students | 4.20 | 0.56 | 4.03 | 0.56 | 1.28 | .202 |
| 4 | Fairness in grading | 4.03 | 0.53 | 3.96 | 0.47 | 0.61 | .545 |
| 5 | Accomplishing specific lesson goals | 3.84 | 0.41 | 3.75 | 0.46 | 0.89 | .373 |
| 6 | Suitability of assgnd textbook | 3.56 | 0.53 | 3.48 | 0.39 | 0.72 | .469 |
| 7 | Suitability of reference materials | 3.78 | 0.42 | 3.55 | 0.48 | 2.01* | .044 |
| 8 | Appropriate tests | 3.89 | 0.49 | 3.62 | 0.47 | 2.31* | .021 |
| 9 | Freshness of presentation | 3.82 | 0.51 | 3.68 | 0.53 | 0.78 | .433 |
| 10 | Knowledge of subject | 4.23 | 0.42 | 4.23 | 0.43 | 0.27 | .785 |
| 11 | Class discussion | 3.79 | 0.57 | 3.60 | 0.57 | 1.37 | .172 |
| 12 | Teacher's interest in subject | 4.23 | 0.43 | 4.17 | 0.45 | 0.46 | .643 |
| 13 | Interesting classroom sessions | 3.36 | 0.71 | 3.06 | 0.61 | 1.81 | .070 |
| 14 | Organization of the classroom sessions | 3.74 | 0.47 | 3.57 | 0.39 | 2.11* | .035 |
| 15 | Teacher's self-confidence | 3.96 | 0.47 | 3.89 | 0.52 | 0.58 | .565 |
| 16 | Clearness of explanations | 3.81 | 0.47 | 3.65 | 0.60 | 0.87 | .383 |
| 17 | Method of presentation | 3.79 | 0.48 | 3.58 | 0.52 | 1.76 | .078 |
| 18 | Feeling between teacher and class | 3.85 | 0.63 | 3.63 | 0.68 | 1.48 | .139 |
| 19 | Understanding teachers talk | 3.89 | 0.53 | 3.75 | 0.65 | 0.87 | .386 |
| 20 | Acceptance of others | 3.95 | 0.54 | 3.91 | 0.53 | 0.69 | .491 |
| 21 | Promotes or encourages thinking | 3.71 | 0.43 | 3.68 | 0.49 | 0.14 | .887 |
| 22 | Presentations holding attention | 3.49 | 0.61 | 3.25 | 0.60 | 1.55 | .121 |
| 23 | Ease in getting help from teacher | 4.09 | 0.47 | 3.87 | 0.66 | 1.80 | .071 |
| 24 | Ease of talking to the teacher | 4.16 | 0.47 | 3.93 | 0.60 | 1.61 | .108 |
| 25 | Sense of humor | 4.00 | 0.70 | 3.78 | 0.74 | 1.25 | .221 |
| 26 | General rating of teacher | 4.10 | 0.54 | 3.93 | 0.59 | 1.36 | .174 |

(CB) N=30 (LB) N=40

The underlined mean indicates which group achieved the higher mean score.
*Significant at the .05 level on a two-tailed test.
**Significant at the .01 level on a two-tailed test.

**TABLE VI**

COOPERATING TEACHER'S AND SUPERVISOR'S REPORT BY CONTROL (LB) AND EXPERIMENTAL (CB) GROUP ON ITEM VARIABLES

| Var. Nr. | Variable Name | LB Group Mean | LB Group SD | CB Group Mean | CB Group SD | Significance t Value | Significance p Value |
|---|---|---|---|---|---|---|---|
| | ATTITUDE | | | | | | |
| 1 | Attitude toward tchg | 4.43 | 0.87 | 4.60 | 0.77 | 1.07 | .286 |
| 2 | Attitude toward pupils | 4.56 | 0.64 | 4.63 | 0.56 | 0.26 | .798 |
| 3 | Cooperation with others | 4.55 | 0.82 | 4.77 | 0.50 | 1.19 | .233 |
| 4 | Attitude toward admin. | 4.40 | 0.96 | 4.53 | 0.73 | 0.31 | .755 |
| 5 | Attitude toward extra-class activity | 4.55 | 0.71 | 4.60 | 0.62 | 0.17 | .865 |
| | SCHOLARSHIP | | | | | | |
| 6 | Knowledge of subject | 4.15 | 0.20 | 4.67 | 0.48 | 2.82** | .005 |
| 7 | Use of English grammar | 4.18 | 0.75 | 4.37 | 0.67 | 1.05 | .294 |
| 8 | General knowledge | 4.25 | 0.67 | 4.43 | 0.63 | 1.15 | .250 |
| | INSTRUCTION | | | | | | |
| 9 | Ability to plan instruction | 4.13 | 0.85 | 4.43 | 0.73 | 1.62 | .106 |
| 10 | Ability to execute plans | 4.13 | 0.79 | 4.47 | 0.68 | 1.99* | .047 |
| 11 | Enthusiasm displayed | 4.33 | 0.92 | 4.33 | 0.76 | 0.26 | .793 |
| 12 | Selection of methods | 4.18 | 0.87 | 4.23 | 0.63 | 0.06 | .953 |
| 13 | Use of modern media | 4.03 | 0.73 | 4.23 | 0.77 | 0.62 | .537 |
| 14 | Awareness of pupils' needs | 4.10 | 0.74 | 4.40 | 0.72 | 1.74 | .082 |
| 15 | Provides for individual differences | 3.93 | 1.07 | 4.17 | 0.83 | 0.73 | .466 |
| 16 | Discussion leadership | 4.20 | 0.72 | 4.40 | 0.68 | 1.19 | .232 |
| 17 | Skill in exposition | 4.10 | 1.08 | 4.30 | 0.79 | 0.60 | .549 |
| 18 | Clarity of assignments | 4.15 | 0.95 | 4.30 | 0.79 | 0.54 | .591 |
| 19 | Pupil evaluation | 4.13 | 1.07 | 4.37 | 0.77 | 0.77 | .442 |
| 20 | Rapport with students | 4.40 | 0.81 | 4.43 | 0.73 | 0.05 | .957 |
| 21 | Mastery of tech skills | 4.10 | 1.17 | 4.33 | 0.61 | 0.35 | .725 |
| | DISCIPLINE | | | | | | |
| 22 | Earns student respect | 4.33 | 0.83 | 4.37 | 0.81 | 0.28 | .778 |
| 23 | Responds to classroom behavior | 4.10 | 0.96 | 4.30 | 0.79 | 0.79 | .432 |
| 24 | Control conducive to learning | 4.20 | 0.79 | 4.33 | 0.86 | 0.26 | .794 |
| | PERSONALITY | | | | | | |
| 25 | Health | 4.53 | 0.88 | 4.67 | 0.61 | 0.53 | .595 |
| 26 | Dress-grooming | 4.45 | 0.75 | 4.63 | 0.54 | 1.45 | .147 |
| 27 | Self-confidence | 4.43 | 0.84 | 4.63 | 0.62 | 0.96 | .337 |
| 28 | Dependability | 4.45 | 1.01 | 4.63 | 0.77 | 0.65 | .494 |
| 29 | Maturity | 4.50 | 0.88 | 4.67 | 0.61 | 0.63 | .526 |
| 30 | Emotional stability | 4.50 | 0.85 | 4.33 | 0.75 | 1.80 | .071 |
| 31 | Voice | 4.53 | 0.73 | 4.45 | 0.[illegible] | 0.88 | .456 |
| 32 | Self-reliance | 4.48 | 0.85 | 4.63 | 0.56 | 0.54 | .593 |

(CB) N=30 (LB) N=40

The underlined mean indicates which group achieved the higher mean score.
*Significant at .05 level on two-tailed test.
**Significant at .01 level on two-tailed test.

"Student Opinionnaire," twenty-four were accepted. No significant difference was found between treatment groups on total score and on twenty-three item variables. Hypotheses for three item variable scores "suitability of reference materials," "appropriate tests," and "organization of classroom sessions" were rejected in favor of the LB group. The results here again favor the control (LB) group just as in the "Teacher's Self-Report" instrument.

Hypothesis One--Cooperating Teacher's and Supervisor's Report

For all subjects, there is no significant difference between the control (LB) group and the experimental (CB) group as measured by the various scores obtained from the "Cooperating Teacher's and Supervisor's Report":

a) Total score (G).
b) Item variable scores (1-32).

These data are shown in Table VI.

Data.--An examination of Table VI shows that the CB group scored higher than the LB group on all thirty-two "Cooperating Teacher's and Supervisor's Report" item variables. Of these two were significant at the established two-tailed, .05 alpha level; however, two other item variable scores were significant at the .05 level on a directional or one-tailed test. The Wilcoxon Rank Sum Test was used in both cases to test significance of difference. Total scores were not significantly different. Z and p values for significant variables are shown in Table VI. The results all point in the same direction as those reported by the trained observer and opposite to the direction generally reflected by the "Teacher's Self-Report" and the "Student Opinionnaire."

Findings.--The total score hypothesis and thirty of the thirty-two item variable hypotheses were accepted. Of the thirty-three subhypotheses for the "Cooperating Teacher's and Supervisor's Report," two were rejected according to established alpha levels. The experimental (CB) group was found to differ significantly from the control (LB) group on only two variables. Significance on these two variables was in the direction of the CB group.

Hypothesis One--Flanders Interaction Analysis System

For all subjects, there is no significant difference between the control (LB) group and the experimental (CB)

group as measured by the various scores obtained on the "Flanders Interaction System Categories":

a) Total score (H1).
b) I/D ratio scores (H2).

These data are shown in Table VII.

Data.--An examination of Table VII shows that the LB group scored higher than the CB group on the FIA score variable. Treatment groups scored about equal on the I/D ratio variable. Using the Wilcoxon Rank Sum Test, there was no significant difference between the CB group and the LB group on eigher of these variables. Z and p values given for the H1 and H2 variables are 1.07 and .285; and for the latter, 0.10 and .919, respectively.

TABLE VII

FLANDERS INTERACTION SYSTEM SCORES BY CONTROL (LB) GROUP AND EXPERIMENTAL (CB) GROUP

| Var. Nr. | Variable Name | LB Group | | CB Group | | Significance[a] | |
|---|---|---|---|---|---|---|---|
| | | Mean | SD | Mean | SD | z Value* | p Value |
| H1 | FIA scores | 3.03 | 1.21 | 2.53 | 1.68 | 1.07 | .285 |
| H2 | I/D ratio | .169 | 0.14 | .168 | 0.17 | 0.10 | .919 |

(CB) N=30 (LB) N=40

The underlined mean indicates which group achieved the higher mean score.

*Significance at the .05 level on a two-tailed test.

[a]Wilcoxon Rank Sum Test and Mann-Whitney U statistic used to determine significance.

Findings.--Total score hypothesis (H1) and I/D ratio score hypothesis (H2) are accepted. No significant difference was found between the control (LB) and the experimental (CB) groups at established alpha levels.

Selected Subgroups Within the Population:

Male and Female.--The pattern of scores for the male and female subgroups is almost identical to that of the combined groups (Tables II through VII).

Four Subject Areas.--Eight of thirty-two null hypotheses were rejected. All eight dealt with "Observer Schedule" and "Teaching Techniques Rating Form" variables. Four of these eight variables were for the social studies group. Data indicates that the experimental (CB) group performed more closely to the criterion than did the control (LB) group.

Grade Levels.--Significance at the .05 level on a two-tailed test shows that group differences were limited to thirteen grade level/variable set comparisons in favor of the CB group and are in favor of the LB group. Hypotheses were accepted for thirty-four of forty-eight grade level/variable set comparisons.

## Letter Grade Scores

For all subjects, there is no significant difference between the control (LB) group and the experimental (CB) group as measured by the "Letter Grade" (J). These data are shown in Table VIII.

Data.--An examination of data shows that the CB group scored higher than the LB group on the total score "Letter Grade" variable (J). Difference between the CB group and the LB group was not significant at established alpha level. The z and p values, 0.96 and .338, respectively, are based upon the Wilcoxon Rank Sum Test, using two-tailed values.

Findings.--Hypothesis for the "Letter Grade" variable was accepted. No significant difference was found between the control (LB) group and the experimental (CB) group as measured by the "Letter Grade" (J).

TABLE VIII

LETTER GRADE SCORES BY CONTROL (LB) GROUP AND EXPERIMENTAL (CB) GROUP

| Var. Nr. | Variable Name | LB Group | | CB Group | | Significance* | |
|---|---|---|---|---|---|---|---|
| | | Mean | SD | Mean | SD | z Value | p Value |
| J | Letter Grade | 4.58 | 0.67 | 4.69 | 0.47 | 0.96 | .338 |

The underlined mean indicates which group achieved the higher mean score.

*Significance at the .05 level on a two-tailed test.

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## Summary of Findings

The findings are summarized in the following pages according to the research questions posited in Chapter I of this report. All hypotheses referred to are null hypotheses. A graphic summary of the main findings is presented in Figure 1.

FIGURE 1 124

SUMMARY OF FINDINGS--INSTRUMENT VARIABLES

| Group | $\bar{x}$ | Item Variables Main Idea | Number | Criterion Category |
|---|---|---|---|---|
| CB | 4.33 | Creating examples | C3,d | |
| | 4.15 | Cognitive development | C3a,b,c,d,e | |
| | 3.90 | Relate to prior knowl. | C4a,b,c | |
| | 3.87 | Content introduction | C2a,b,c | Cognitive |
| | 3.76 | Asks stimulating questions | D15 | |
| | 2.82 | Knowledge of subject | G6 | |
| | 3.51 | Teaching techniques | D1-8,12-15, 17-19,22,23 | |
| | 3.28 | Maintaining discipline thru effective teaching | D3 | |
| | 3.25 | Translates objectives into learning activities | D7 | General |
| | 2.33 | Awareness of different ways to present info. | D1 | |
| | 1.99 | Ability to execute plans | G10 | |
| | 3.06 | Conveying goal expectations | C16 | |
| | 3.03 | Relational/interactional | C1a,b,c,e | |
| | 2.77 | Motivation for instruction | C1f | Affective |
| | 2.46 | Clarity of inst. goals | C1,b | |
| CB | 2.45 | Acceptance of students | C1a | |
| | 1.96 | | | |
| | | NONSIGNIFICANT AREA | | |
| MDN | 0 | | | |
| | | NONSIGNIFICANT AREA | | |
| | 1.96 | | | |
| LB | 1.98 | Class conscious of language & spelling | E40 | |
| | 1.98 | Shun habit of purposeless griping | E14 | |
| | 2.01 | Suitability of ref. mats. | F7 | |
| | 2.04 | A good housekeeper | E15 | Traditional |
| | 2.11 | Organ. of class sessions | F14 | |
| | 2.23 | Control of clrm lighting | E20 | |
| | 2.30 | Appropriateness of tests | F8 | |
| | 2.34 | Await signal for dismissal | E3 | |
| LB | 2.36 | My voice as a teaching aid | E10 | |

## SUMMARY AND CONCLUSIONS

Based upon the findings in this investigation and in view of limitations stated on page eight, the trained observers found the UMC competency-based course superior to the lecture-based course on almost all instrument items. The cooperating teachers and college supervisors also favored the experimental (CB) group, but only on a few instrument items. Ratings on self-assessment and classroom "student opinionnaire" instruments favored the control group (LB) on several instrument items.

The following are specific conclusions based upon the findings derived from this study.

1. The competency-based general secondary methods course resulted in better classroom performance of student teaching than the lecture-based course as rated by trained observers using a wide variety of general teaching criteria.

2. The competency-based student teachers demonstrated a higher level of those teaching competencies emphasized in this course than did the lecture-based student teachers.

3. In general, self-assessment data for the competency-based student teachers did not differ from that of the lecture-based student teachers.

4. In general, the classroom students' opinion about the competency-based student teaching did not differ from their opinions about the lecture-based student teaching.

5. In general, the student teaching record data and student teaching grade as reported by the cooperating teachers and university supervisors for the competency-based student teachers did not differ from those of the lecture-based student teachers.

6. In general, the competency-based student teacher interaction with classroom students did not differ from that of the lecture-based student teachers.

### Discussion

Information relative to findings and conclusions derived from the study is presented here. Implications or suggestions which seem to be reflected in the data are also included.

Discussion of conclusions.--The main conclusion, that the CB (competency-based teacher education) course is superior to the lecture-based course, supports the claims made by many advocates of competency-based teacher education. The AACTE, through the work of Dr. Donald Medley, Dr. David Krathwohl, and Dr. Edward Pomeroy, to name a few, have encouraged teacher education institutions to pursue the competency-based approach.

The competency-based course involved in this study differed from the lecture-based course in that there was:

1. Weekly laboratory performance by each individual education student.
2. Specific weekly focus on a wide variety of clearly identified instructional objectives.
3. A wide variety of teaching examples and frequent discussion of many teaching alternatives.
4. A "team" effort based upon mutual trust, a democratic and nonevaluative relationship with peers, laboratory leaders, instructors, and professors.
5. A systemic and cyclic approach which provided continuous feedback upon which the student could build teaching competence and provide him with a personal commitment for self-improvement.

The design of the UMC competency-based course, for the most part, is consistent with the criteria for competency or performance-based programs published by AACTE. It possesses such essential elements as a personalized curriculum, student responsibility, self-direction, a commitment to learning, accountability, recognition of the needs of students, cooperative planning, development of specific competencies, continuous observation and practice of skills, and a professional interaction experience with others.

The superiority of the competency-based course over the lecture-based course at UMC is further supported by the high degree of enthusiasm and receptivity that students exhibited when queried about the course. Nibondh Thaipanich completed a doctoral study on attitude change resulting from taking the competency-based course and found that student attitude toward teaching increased significantly during exposure to the CB course. Specific emphasis using the laboratory approach upon instructional objectives and competency development appears to result in better teaching performance than when using the lecture-based approach.

Trained observers noticed a greater difference in the performance of the two groups than the classroom students, the student teachers, and the cooperating teachers and supervisors. According to criteria employed in rating performance, trained observers were more behavior oriented than other raters who appeared to be trait oriented. The trained observers were trained to seek out behaviors which related to instructional variables. Observers were instructed not to consider traits, characteristics, and other covert qualities as bases for their ratings. In general, the instruments used by classroom students and cooperating teachers and supervisors tended to include more trait oriented statements than the observer instruments. The trained observers appeared to be more precise in their assessment of the phenomenon under study. All their ratings were in the direction of the CB group and only eight out of forty-two item variables contained on the "observation schedule" and "teaching techniques rating form" were not significant.

Trained observers found a greater difference in student teaching performance for those objectives which were clearly identified and for which opportunities for development of skills were provided during the CB instrutional process. The CB course focused upon only a few of the many possible teaching competencies resulting in students showing greater development in the selected competencies. Of all competencies measured those selected for the CB course were demonstrated most frequently. Differences between the CB group and the LB group rating scores on such item variable subsets as "relational/interactional," "content introduction," "cognitive development," and "relating instruction to prior knowledge" was significantly higher for the CB group at the .01 level of significance or higher.

Self-rating scores were generally higher for the LB group than for the CB student teachers, but the lecture-based student teachers did not rate themselves significantly higher than the competency-based student teachers except on the following item variables:

10. How does my voice rate as a teaching aid? (harsh, monotonous, etc.)
3. Does my class await my specific signal for dismissal regardless of bells or other interruptions?
14. Do I shun the habit of purposeless griping about things that are nobody's fault and cannot be easily remedied?
15. Am I a good housekeeper?

20. Do I control the lighting in my class insofar as I am able by proper use of blinds, lights, etc.?
40. Do I make my class language conscious and spelling conscious in all written and spoken work?

This could imply that the competency-based group was more critical of themselves as a result of a more realistic (with emphasis upon "doing it") prestudent teaching experience than the LB group. Further, it appears that the CB group was less responsive to the more traditional expectations frequently emphasized by supervisors of student teachers and school administrators.

Although more than 1,600 students contributed to the data compiled on variable F, "student opinionnaire," results indicate a pronounced departure from expectations which are generally held by those who possess a child-centered frame of reference. A consistent and sometimes negative reaction seemed to pervade the responses provided by the students in grades seven through twelve. It appears that classroom students were more comfortable with traditional teachers who followed expected and well-established teaching practices. On the other hand, the competency-based "dosage" may have been insufficient to have a strong effect on classroom students, expecially in view of the traditional teacher influence which seemed to function as a constant in this setting. However, in view of the inconclusiveness and sometimes contradictory information yeilded by the "student opinionnaire" and the "self-report," there appears to be little evidence in this study which would justify the use of these approaches to assessment of "global" teaching behaviors in the classroom.

In general, the cooperating teachers and university supervisors did not rate the competency-based student teachers significantly higher than the lecture-based student teachers, except on the following item variables: "6. Knowledge of subject" and "10. Ability to execute plans."

Although letter grade scores and composite scores favored the competency-based group, findings reflect no significant difference between treatment groups on these criteria. $\bar{Z}$ values of 0.96 and 1.35, respectively, are reported in the findings. (A $\bar{z}$ value of 1.64 is required for significance at the .05 level on a one-tailed, directional test.)

Although not significant ratings on everyone of the twenty-six item variables on the classroom student "opinionnaire" tended to favor the lecture-based (LB) group. This would suggest, again, that classroom students were more comfortable with traditional teaching behavior. Since it is likely that the LB student teachers taught the way they were taught, classroom students felt more comfortable with them and tended to rate them higher.

In contrast to classroom student ratings and although not significant, the cooperating teachers and college supervisors rated the competency-based student teachers slightly higher than the LB student teachers on everyone of the thirty-two item variables. This suggests that the cooperating teachers and college supervisors viewed teaching behavior similar to that of the trained observers. It may be stated with some degree of accuracy that as viewed by professional observers (classroom observers, cooperating teachers, and university supervisors), student teachers who completed the competency-based course were better teachers according to criteria included in this study than those who completed the lecture-based course.